country where caves are available (Slater 1971); most maps of distribution indicate that this species ranges into the Cooper Creek area today but not into the more arid central parts of Australia. Parker (1977) has recently demonstrated, however, that records along the Cooper are really of the Barn Owl *Tyto alba,* not of *T. novaehollandiae.* Thus, the occurrence of a fossil Masked Owl in this area is an extension of geographical range of this species during the Pleistocene. Despite several erroneous reports of *T. novaehollandiae* in inland Australia, ARMcE believes that he observed this species in the Attack Creek area of the Northern Territory and makes the significant comment that individuals from the interior are smaller and paler than southern ones (based on specimens in NMV) and could easily be mistaken for Barn Owls.

Thus, the Masked Owl's occurrence near Cooper Creek is somewhat unexpected in the Pleistocene, which would then have provided wetter, more heavily vegetated river banks and presumably suitable shelter for this species than now. The small size of the Pleistocene fossil owl in comparison to those in our sample of modern Masked Owls, which unfortunately did not include any specimens from central Australia, may indicate that a small *T. novaehollandiae* has occupied the arid and more northerly latitudes of Australia for some time.

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SUBSPECIATION IN THE WHITE-THROATED WARBLER OF AUSTRALIA AND NEW GUINEA

The White-throated Warbler *Gerygone olivacea* occurs in coastal eastern and northern Australia, continuously from south-eastern South Australia to the Kimberley of Western Australia (McGill 1970) and in south-eastern New Guinea (Rand and Gilliard 1967). In south-eastern Australia it is a regular migrant, moving north presumably to central coastal Queensland (Storr 1973) in March–April and south in August–September.

Meise (1931) in his taxonomic revision of *Gerygone,* recognized four subspecies:

1. *olivacea.* Coastal eastern Australia north to the Barron River, Cairns district.
2. *flavigasta.* Western side of Cape York Peninsula between Normanton and the Watson River. Diagnosed as smaller (wing 55.5–57.5 against 56–62 mm), lighter and less olive above and with a narrower band of white on the base of the tail (5–10.5 against 17 mm) than the nominate form.
3. *rogersi.* Kimberley and the Northern Territory east to Brock's Creek. Like *flavigasta* but with grey (rather than white) barely discernible patches on the inner vanes of the base of the tail and perhaps smaller (wing 52–56 mm).
4. *cinerascens.* New Guinea, in the savanna country between Port Moresby and the Aroa River. Dorsum pale grey with only a tinge of olive and tail with little white at the base (4 mm wide).

Unfortunately Meise lacked material from the central and eastern parts of Cape York Peninsula and the western and southern sides of the Gulf of Carpentaria; so he was unable to determine how *olivacea* and *flavigasta* intergraded. Reader's Digest (1976) accepted all three subspecies for Australia. Storr (1973) amended the distributions as given by Meise, listing the range of *olivacea* as north to Rockingham Bay, Lake Lucy (upper Burdekin River) and the upper Flinders River (Hughenden area) and that of *flavigasta* as Cape York Peninsula, south to Kirrama (inland of Rockingham Bay) and the upper Einasleigh River, north-western Queensland, south to Lawn Hill and Sedan. However, Hall (1974) found that *rogersi* occurs east to Moonlight Creek, north-western Queensland, and *flavigasta* west to Wernadinga (just west of the lower Leichhardt River, head

of the Gulf of Carpentaria), without any apparent intergradation between them.

From March to June 1976 I studied *G. olivacea* in the block of country between Torrens Creek, Townsville, Greenvale, Mt Garnet, Wrotham Park, Torwood, Normanton and Gilberton, north-eastern Queensland and southern Cape York Peninsula. It was common everywhere (even before any migrants would have arrived) especially in stringybark, bloodwood–melaleuca and riverine woodlands. On 13 May a pair, which was seen attending a nest near Haydon, indicated that residents as well as possible migrants were present at this locality. Several specimens were collected and later compared with material in the American Museum of Natural History (AMNH), British Museum of Natural History (BM), Australian Museum (AM), National Museum of Victoria (NMV) and Queensland Museum (QM). Care was taken not to confuse migrants with residents. The results indicate that only two subspecies are clearly recognizable according to whether white is present (*olivacea*) or absent (*rogersi*) on the base of the tail-feathers.

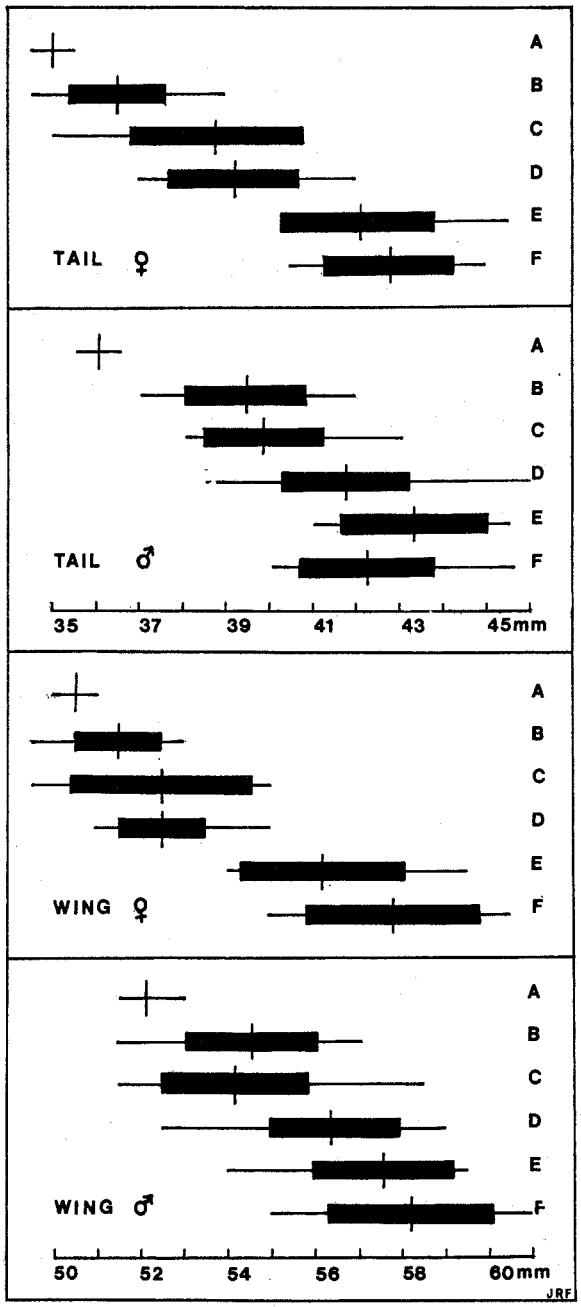

Figure 1. Graphs showing variation in lengths of wing and tail with locality. The vertical line, the horizontal line and the solid rectangle give respectively the mean, the range and one standard deviation each side of the mean. The localities are: **A**, New Guinea (*cinerascens*); **B**, north-western Australia (*rogersi*); **C**, Cape York Peninsula (north of Normanton-Cairns); **D**, base of Cape York Peninsula to central coastal Queensland; **E**, south-eastern Queensland to northern New South Wales; and **F**, southern New South Wales to Victoria. The number of specimens from each area are **A** 3 ♂, 2 ♀; **B** 29 ♂, 14 ♀; **C** 22 ♂, 10 ♀; **D** 24 ♂, 13 ♀; **E** 10 ♂, 6 ♀; **F** 8 ♂, 7 ♀.

As demonstrated in Figure 1, size (based on the lengths of the wing and the tail) decreases clinally from south to north in eastern Australia. The New Guinean population carries on this trend. There also appeared to be a slight decrease in the tone of olive on the dorsum on going northwards, this being accentuated in *rogersi* and *cinerascens*, probably because they were or are geographically isolated.

As regards the amount of white on the base of the tail, this seems also to vary clinally in eastern Australia, the trend being continued by the New Guinean population. Presumed residents from as far north as the Mitchell River have fairly large patches of white and could not be satisfactorily distinguished from residents from the base of Cape York Peninsula (Normanton–Georgetown to Mt Garnet) and from between Torrens Creek and Townsville. Thus, specimens from the ranges of *flavigasta* (type-locality Normanton) and *olivacea* could not be separated. As already reported by Hall (1974) and confirmed by me, a specimen (BM) from Wernadinga has much white at the base of the tail. However, specimens from Moonlight Creek (BM) and the Gregory River (AMNH) and presumably elsewhere in north-western Queensland (including the northern Isa Uplands) have no white.

Geographical contact and hybridization between

rogersi and *olivacea* is suggested by a specimen (AMNH) from the Leichhardt River (presumably the lower reaches). As assessed by the amount of white on the tail, it is intermediate, having only tiny patches of white on the outer vanes of the outermost two rectrices. Accordingly, the distributions of the two Australian subspecies are as follows:

1. *olivacea* (synonym *flavigasta*). Eastern Australia, Cape York Peninsula, and the area round the Gulf of Carpentaria, west to the lower Leichhardt River, where it hybridizes with the next form.
2. *rogersi*. Northern Australia, including northwestern Queensland, east to about the Leichhardt River and south to Lawn Hill and presumably the upper Cloncurry River (Sedan) (cf. Storr 1973).

Presumably subspeciation in *G. olivacea* was caused by previously unfavourable conditions in the region of the Gulf of Carpentaria. The barrier was caused by either unsuitable habitat when New Guinea and Australia were joined during the last glaciation or a very arid climate on the southern side of the Gulf. Other examples of subspeciation and speciation caused by this barrier (the Carpentarian Barrier) are discussed by Keast (1961) and Macdonald (1969). As evidenced by the occurrence of *olivacea* at Wernadinga and the hybrid specimen (*olivacea* x *rogersi*) from the Leichhardt River, *olivacea* has crossed the savanna grasslands between the Flinders and Leichhardt Rivers (see 1976 ed. Atlas Australian Resources: Natural Vegetation). Further investigations are now needed to determine the width of the hybrid zone.

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SOCIAL FEEDING OF FRUIT-PIGEONS IN NEW GUINEA

Many bird populations on islands occupy broader ecological niches than mainland conspecifics, often associated with a lower number of congeneric species (e.g. Diamond 1970, Proc. natn. Acad. Sci. USA 67: 529-536). This note describes the ecological relations of two fruit-pigeons, *Ptilinopus coronulatus* and *P. iozonus*, on an island and at a nearby mainland site in Papua New Guinea. Conditions on the island allow an apparently adaptive interspecific interaction not possible on the mainland.

During July–September 1973, I observed birds near Anguganak, West Sepik District (03°36′ S, 142°15′ E) and on Kairiru Island, East Sepik District, Papua New Guinea. In lowland forest at Anguganak there were seven species of *Ptilinopus* (*nanus, magnificus, perlatus, coronulatus, iozonus, superbus, ornatus*). *P. corunulatus* was confined to the forest understorey usually singly or in small conspecific groups, although occasionally feeding in company with *P. superbus* and *P. perlatus* in fruiting palms. They were never seen with *P. iozonus*, which habitually remained in the high branches of tall trees, in groups of three or four birds. A group of three *P. iozonus* descended nearly to ground-level on the edge of a village clearing to feed in a fruiting tree, which was visited at other times by *P. perlatus* and once by *P. coronulatus*. The segregation of *P. iozonus* and *P. coronulatus* by position in the vegetational profile has been recorded elsewhere on the New Guinea mainland by Goodwin (1970, Pigeons and Doves of the World, 2nd ed., British Museum (Nat. Hist.)) and Diamond (1972, Avifauna of the Eastern Highlands of New Guinea, Publ. Nuttall orn. Club 12).

On Kairiru, the two species were common throughout forest up to about 900 metres, *P. iozonus*